

## REMARKS

By this Amendment, Applicants have amended claims 2, 3, 6, 8-10, 12-16, 21 and 22 to depend from claim 7. Claims 1, 11 and 23 have been canceled without prejudice or disclaimer.

Since claim 7 is now the sole independent claim in the application, and the remaining claims ultimately depend therefrom, the rejection of claims 1 and 23 under 35 U.S.C. 102(b) as allegedly being anticipated by U.S. Patent No. 5,554,347 to Busson et al or U.S. Patent No. 5,270,016 to Alagy et al., the rejection of claims 1, 3, 6, 10, 11, 13-16 and 21-23 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,027,635 to Busson et al. and the rejection of claims 2, 4-9, 11 and 12 under 35 U.S.C. 103(a) as being unpatentable over Busson et al. '347 or Alagy et al. in view of Grehier et al. are moot.

Claims 2, 4, 5, 7-9, 11 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Busson et al. '635 in view of U.S. Patent No. 4,612,982 to Grehier et al. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a reactor device for carrying out chemical reactions requiring heat exchange. As shown, by way of example only in the figures, e.g., Figures 1-3, the reactor R is elongate along an axis XX' and has, at a first end, at least one means 16 for supplying at least one reactant, and, at an opposite end, at least one means 18 for evacuating effluents. A plurality of heat exchange means 12 are provided in the reactor R and they are separated by at least by internal partition 14 participating in

controlling the residence time of the reactant or reactants and increasing the heat exchange surface inside the reactor. Passages are provided for circulating the reactant or reactants and/or effluents between the heat exchange means 12 and the internal partitions 14. The reactor of the present invention has at least one enclosure 10 made of a refractory material ensuring heat insulation and containing the heat exchange means 12 and the internal partitions 14. The enclosure 10 is contained in an envelope 20 containing the reactant and/or reactants and/or effluents circulating inside the reactor.

The enclosure 10 can have a dual role. That is, it is a heat insulator to protect the outer containment envelop 20 of the reactor R and may have a shape generating the internal space necessary for its participation for controlling the flow and residence time of the fluid circulating in the reactor.

The claims now recite the inclusion of an outer shell whose cross-section is substantially circular and whose inside diameters is substantially equal to the largest dimension of the outside diagonal of the containment envelope. One embodiment of a reactor device including an outer shell is shown in Figure 3 and described at page12, lines 3-9 of Applicants' specification. As can be seen therein, the containment envelope 20 is provided within the outer shell 22. Such construction is useful for higher pressure operation, e.g., greater than 2 bars absolute.

The Busson et al. '635 patent discloses a reactor 40 divided into longitudinal rows 1-6 that are substantially parallel to its axis. These rows are separated from each other by nonimpermeable walls 70 which are of ceramic

materials, the shape of which comprises cells adapted to encourage turbulence inside the row and thus to encourage the reaction. These rows contain sleeves of ceramic material 7 forming a layer which is substantially parallel to the reactor axis.

It is submitted the walls 70 of Busson et al. '635 do not constitute and "enclosure." As noted above, "enclosure" is defined as "something that encloses"; and "enclose" is defined as "to surround on all sides." It is submitted the walls 70 of Busson et al. '635 are not disclosed to surround the inside of the reactor 40 on all sides. Accordingly, the Busson et al. '635 patent does not anticipate the presently claimed invention.

Moreover, it is submitted Busson et al. '635 does not disclose a reactor device in which the enclosure is fitted to the containment envelope in such a way as to prevent gas bypasses between the outside of the enclosure and the inside of the envelope.

The Examiner relies on the teachings of Grehier et al. only for demonstrating that heat transfer plates can be stacked into lattices to form a modular structure. However, clearly the Grehier et al. patent does not remedy any of the deficiencies noted above with respect to Busson et al. '635.

Moreover, the Examiner's reference to aspects of the present invention being "merely a matter of obvious engineering choice," etc. without providing any teachings in the prior art supporting these conclusions is not the type of objective evidence and specific factual findings necessary to support an obviousness rejection. *In re Lee*, 277 F3d 1338, 1342-44, 61 USPQ 2d 1430,

1433-34 (Fed. Cir. 2002).

The Examiner further alleges "it would have been obvious in view of the applied references to one having ordinary skill in the art to change the size and shape the shell (reactor wall) versus the envelope (12) to optimize the reaction zone. In addition, the court held that a change in size and shape is not patentably distinct over the prior art." In support of this, the Examiner cites a number of old decisions. In the first place, every claim must be considered as a whole. There can be no general rule that a change of size and shape does not patentably distinguish subject matter from the prior art. To the extent the Examiner alleges the cited cases to hold otherwise, the cases are inconsistent with the requirement that there must be motivation to modify or combine the prior art documents. See, e.g., *In re Fine*, 837 F.2d 1071, 5 USPQ 2d. 1596 (Fed. Cir. 1988); *In Vaeck*, 947 F.2d 488, 28 USPQ 2d. 1438 (Fed. Cir. 1991).

Moreover, the Examiner apparently misunderstands the limitations of claim 7 since claim 7 does not merely recite a change in size and shape. Rather, the claims recite the inclusion of an outer shell whose cross-section is substantially circular and whose inside diameters is substantially equal to the largest dimension of the outside diagonal of the containment envelope. One embodiment of a reactor device including an outer shell is shown in Figure 3 and described at page 12, lines 3-9 of Applicants' specification. As can be seen therein, the containment envelope 20 is provided within the outer shell 22. Such construction is useful for higher pressure operation, e.g., greater than 2 bars absolute. Thus, the claims do not merely recite a change of size

or shape, but recites the inclusion of an additional element, i.e., the outer shell. The reactor device set forth in claim 7, including the outer shell is neither disclosed nor suggested by Busson et al. '635 or Grehier et al. Accordingly, the claims as presently amended are patentable for this additional reason.

For the foregoing reasons, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 612.41239X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

A handwritten signature in black ink, appearing to read 'Alan E. Schiavelli', is written over a horizontal line.

Alan E. Schiavelli  
Registration No. 32,087

AES/at  
(703) 312-6600